WHAT IS CLAIMED IS:

1. A method for carrying out multiple chemical reactions, said method comprising:

(a) bringing a plurality of electrodes supported by a semiconductor substrate into proximity with a reaction medium, said reaction medium comprising reagents for carrying out said chemical reactions,

(b) sending an item of numerical data to storage means in each of a plurality of cells within said semiconductor substrate by means of a data bus, said item of numerical data participating in the selection of a voltage to be applied to said electrodes, and

(c) sending an address to address decoders in communication with said storage means, whereby said item of numerical data is stored in said storage means and electric signals are selectively applied to each of said electrodes and whereby a chemical reaction takes place proximal to and in response to the field at said electrodes to which said electric signals are selectively applied.

2. The method of Claim 1 wherein said item of numerical data is binary numerical data.

3. The method of Claim 1 wherein said electric signals are selectively applied to each of said electrodes by means of a plurality of digital analog converters, each electrically coupled to a respective electrode and each being associated with a respective cell.

4. The method of Claim 3 wherein said item of numerical data is one bit in length and wherein said digital analog converters are integral with said storage means.

5. The method of Claim 1 wherein said electric signals are selectively applied to each of said electrodes by means of a plurality of analog converters, each electrically coupled to a respective electrode and each being associated with a respective cell.

6. The method of Claim 1 wherein an insulative layer covers said plurality of electrodes.

7. The method of Claim 6 wherein said insulative layer is removable from said semiconductor substrate.

8. The method of Claim 1 wherein said reagents are responsive to electric fields.

9. The method of Claim 1 wherein said reagents are reagents for carrying out synthesis of polynucleotides.

10. The method of Claim 7 wherein said reagents are nucleoside phosphoramidites or nucleoside phosphonates.

11. The method of Claim 1 wherein an array of oligonucleotides is synthesized on a surface of said semiconductor substrate.

12. The method of Claim 11 wherein from about 10^2 to about 10^8 different oligonucleotides are synthesized, each in an area of from about 2 micron by 2 micron to about 500 by 500 micron.

13. The method of Claim 11 wherein said oligonucleotides are about 10 to 30 nucleotides in length.

14. The method of Claim 1 wherein said chemical reaction comprises selectively generating a reactive species at said electrodes.

15. The method of Claim 1 wherein said chemical reaction comprises deprotecting a molecule at said electrode.

16. The method of Claim 1 wherein said medium is a non-aqueous medium.

17. The method of Claim 1 wherein said item of numerical data is representative of an electric signal

18. The method of Claim 1 wherein a plurality of analog buses are employed

and said item of numerical data identifies which analog bus connects to said electrode.

19. A method for carrying out multiple chemical reactions, said method comprising:

(a) bringing a device into proximity with a reaction medium, said reaction medium comprising reagents for carrying out said chemical reactions, said device comprising (i) a semiconductor substrate, (ii) a plurality of electrodes supported by said semiconductor substrate, (iii) a plurality of cells within said semiconductor substrate, (iv) a plurality of digital analog converters, each electrically coupled to a respective electrode and each being associated with a respective cell, (v) address decoders in communication with each of said cells, (vi) a data bus for delivering binary numerical data to each of said cells, (vii) address buses for delivering addresses to said address decoders, and (viii) storage means in each of said cell for storing said numerical data, said storage means being in communication with said digital analog converter in said cell,

(b) sending binary numerical data to said storage means of each of said cells by means of said data bus, said binary numerical data being representative of an electric signal, and

(c) sending addresses to said address decoders whereby said binary numerical data is stored in said storage means and electric signals are selectively applied to each of said electrodes by means of said digital analog converters and a chemical reaction takes place proximal to and in response to the field at said electrodes.

20. The method of Claim 19 wherein said reagents are reagents for carrying out synthesis of oligonucleotides.

21. A device comprising:

(a) a semiconductor substrate,

(b) at least one surface for carrying out a chemical reaction,

(c) an electrode adjacent said surface and supported by said semiconductor substrate,

(d) a cell within said semiconductor substrate,

(e) a digital analog converter to which said electrode is electrically coupled, said digital analog converter being associated with said cell,

(f) an address decoder in communication with said cell,

(g) a data bus for delivering an item of numerical data to said cell,

(h) an address bus for delivering an address to said address decoder, and

(i) storage means in said cell for storing said item of numerical data, said storage means being in communication with said digital analog converter.

22. A device comprising:

(a) a semiconductor substrate,

(b) at least one surface for carrying out chemical reactions,

(c) a plurality of electrodes supported by said semiconductor substrate,

(d) a plurality of cells within said semiconductor substrate,

(e) a plurality of digital analog converters, each electrically coupled to a respective electrode and each being associated with a respective cell,

(f) address decoders in communication with each of said cells,

(g) a data bus for delivering an item of numerical data to each of said cells,

(h) address buses for delivering addresses to said address decoders, and

(i) storage means in each of said cell for storing said item of numerical data, said storage means being in communication with said digital analog converter in said cell.

23. The device of Claim 22 wherein said data bus is for delivering binary numerical data.

24. The device of Claim 22 further comprising an insulative layer covering said device at least at said plurality of electrodes.

25. The device of Claim 22 wherein said insulative layer is removable.

26. The device of Claim 22 comprising from about 10^2 to about 10^8 different cells, each in an area of from about 2 micron by 2 micron to about 500 by 500 micron.

27. The device of Claim 22 further comprising a plurality of analog buses.

28. The device of Claim 22 further comprising means to electrically test the

device before use.

29. The device of Claim 28 wherein said means is an additional line exiting said substrate, said line being connected in parallel to every array circuit cell, wherein each cell has an analog switch that allows sequential connecting of its analog output voltages to said bus when said cell is addressed.

30. A chip for electronically addressing a matrix of sites, each site to which may be directed a chemical reaction; said chip comprising:

(a) a semiconductor substrate;

(b) a matrix of electronic circuit cells fabricated within said semiconductor substrate,

(c) address decoders for activating a cell in response to an address applied to said chip;

(d) a data bus for delivering binary numerical data to said cells;

(e) storage means in each of said cells for storing binary numerical data from the data bus when activated by addresses decoded by said address decoders,

(f) digital to-analog conversion means in each cell for converting binary numerical data into an electrical signal;

(g) an electrode plate connected to each of said digital-to-analog conversion means, wherein electrical signals representative of said binary numerical data are selectively applied to each of said electrode plates for the purpose of inducing, when the device is placed proximal to a chemical medium, selective chemical activity according to the binary numerical data provided.

31. A method for carrying out multiple chemical reactions, said method comprising:

(a) bringing a plurality of electrodes supported by a semiconductor substrate into proximity with a reaction medium, said reaction medium comprising reagents for carrying out said chemical reactions,

(b) sending an item of numerical data to storage means in each of a plurality of cells within said semiconductor substrate by means of a data bus, said item of numerical data being representative of an electric signal, and

(c) sending an address to address decoders in communication with said

storage means, whereby said item of numerical data is stored in said storage means and electric signals are selectively applied to each of said electrodes by means of a plurality of digital analog converters, each electrically coupled to a respective electrode and each being associated with a respective cell, and whereby a chemical moiety proximal to said electrode is selectively activated for reaction with a reagent in said reaction medium, said selective activation being in response to the field at said electrodes to which said electric signals are selectively applied.

32. The method of Claim 31 wherein said chemical moiety is a reagent for oligonucleotide synthesis.

33. A method of fabricating a plurality of individual chips, each for electronically addressing a matrix of sites, each site to which may be directed a chemical reaction, said method comprising:

(a) preparing a plurality of said chips on a single silicon substrate, and

(b) severing said single silicon substrate into said individual chips.

34. The method of Claim 33 wherein said chemical reaction is part of a synthesis of oligonucleotides.

35. The method of Claim 34 wherein oligonucleotide arrays are synthesized on said chips on said single silicon substrate,